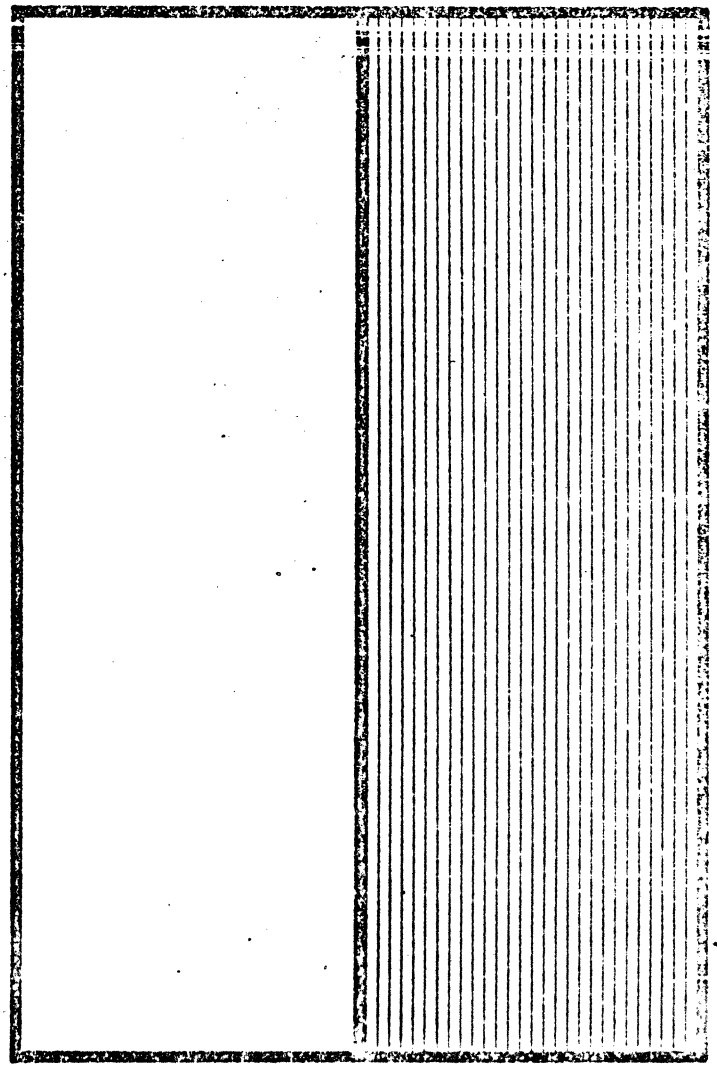
SPERRY RAND

UNIVAC 9400 SYSTEM

PROGRAM DESCRIPTION DRAWING



CUSTOMER ENGINEERING

409169

SPERRY RAND UNIVAC

DRAWING NO. 4091697

REVISION A

CUSTOMER ENGINEERING
PRODUCT DIAGNOSTIC SOFTWARE

9400 5024/8414 FUNCTIONAL TEST - D4110
PROGRAM DESCRIPTION DRAWING

	SIGNATURE	TITLE	DATE
APPROVAL		Manager	
APPROVAL		Supervisor	
APPROVAL		Programmer	
APPROVAL		Programmer	

REVISION STATISTICS RECORD

DWG REV	MSTR REV	RELEASE DATE	DESIGNER NAME	EIR NUMBER	FCO NUMBER
A	M	11/1/72	PDS Phila., Pa.	C12606	

4091697

REVISION DESCRIPTION RECORD

REV	DESCRIPTION	UD #
A	Provide a cross reference between factory and Customer Engineering diagnostics. Provide the latest enhancements requested by Customer Engineering along with the latest factory testing techniques.	881

TABLE OF CONTENTS

SECTION		PAGE
1.	INTRODUCTION	5
	1.1 Purpose	5
	1.2 Major Objectives	5
	1.3 Equipment Configurations	5
	1.4 Associated Software	5
	1.5 Reference Documents	5
2.	FUNCTIONAL DESCRIPTION	6
	2.1 General Organization	6
	2.2 Program Description	6
3.	OPERATING PROCEDURES	8
	3.1 Initialization	8
	3.2 Test Program Parameters	8
	3.3 Test Program Messages	8
4.	SUPPLEMENTARY DATA	9
	4.1 Supplementary Software Information	9
	4.2 Supplementary Hardware Information	9

1. INTRODUCTION

1.1 Purpose. This document describes a 9400 Maintenance test program for the 5024/8414 Disc Subsystem.

1.2 Major Objectives. The objective of this program is to test the Seek and Recalibrate commands of the 5024/8414 Disc Subsystem. Test organization and operator options are intended to satisfy the needs of Design, Quality Control and Field Engineering personnel in checkout, acceptance and maintenance activities.

1.3 Equipment Configurations. All equipment configurations must be connected to a Selector I-O channel of the 9400 processor. This test will operate the following equipment configuration:

--Disc File Control - Type 5024
--Disc Drive - Type 8414
--Disc Pack Assembly - Type F1214

1.4 Associated Software. This program has DSKH included as an integral part of the program. This is the standard disc handler routine used by all Disc Maintenance test programs. It is the interface between the program and MCR, which performs program load, parameterization, execution, deletion, I-O handling, and message handling.

1.5 Reference Documents.

DRAWING	REVISION	DESCRIPTION
S70040	A	UNIVAC 9400 Processor, Type 3019-00 and -01.
--	-	UNIVAC 9400 Dual I-O Selector Channel, Type XXXX-00 and -01.
P10076	A	Disc File Control, Type 5024.
P21109	-	8414 Disc File.
4091622	-	Maintenance Control Routine.
4091623	-	Parameter and Message Routines.
3844459	-	5024/8414 Disc Program Handler.

2. FUNCTIONAL DESCRIPTION

2.1 General Organization. This program tests the Seek and Recalibrate commands of the 5024/5414 Disc Subsystem. Two and four point positioning of heads is performed as well as a test with worse case actuator conditions.

2.2 Program Description.

2.2.1 Test 1 (Group Test)

Objective - The objective of test 1 is to enable several tests to be internally selected simply by entering subtest 1. Test 1 selects tests 2 thru 4.

Method - The program places bits into the parameter location which tells DSKII which tests to enter.

2.2.2 Test 2 (Two Point Positioning)

Objective - The positioning mechanism is tested by issuing various two point positioning patterns.

Method - Eight series of chains consisting of two Seek commands per chain are issued. The first Seek of each chain is held constant at either the lower or upper limit of the test area while the other Seek steps by one cylinder at a time. Home address is read after each Seek to verify that the correct cylinder had been located. Each of the series of chains is described below.

1) The first Seek is held constant at the lower limit of the test area. The second Seek starts at the next higher cylinder and is incremented until it reaches the upper limit of the test area.

2) The first Seek is held constant at the upper limit. The second starts at the next lower cylinder and is decremented until it reaches the lower limit.

3) The first Seek is held constant at the lower limit. The second starts at the upper limit and is decremented until it reaches the lower limit.

4) The first Seek is held constant at the upper limit. The second starts at the lower limit and is incremented until it reaches the upper limit.

5) Same as series 2.

6) Same as series 1.

7) Same as series 4.

8) Same as series 3.

2.2.3 Test 3 (Four Point Positioning)

Objective - The positioning mechanism is tested by issuing a four point positioning pattern.

Method - A chain containing four Seek commands is repetitively issued. Each Seek is followed by a Read HA command to verify that the correct cylinder was located. The first Seek of the chain specifies the lower limit of the test area. The second Seek is one less than the upper limit. The third specifies the upper limit. The fourth is one more than the lower limit. The first and third Seeks remain constant. On each issuance of the chain, the second Seek is decremented by one, while the fourth is incremented by one. This continues until the limits of the test area are reached.

2.2.4 Test 4 (Selected Sequence Positioning)

Objective - A weakness in the positioning mechanism may be detected by selecting a sequence of cylinder positioning.

Method - The test seeks according to a positining table. From 2 to 4 cylinders may be issued in a chain which may be issued repetitively.
Home address is read after each Seek and examined for validity.

2.2.5 Test 5 (Worse Case Actuator)

Objective - Possible undershooting or overshooting is tested with worse case actuator conditions.

Method - The following ten pairs of Seeks are issued:

Cylinders 6 and 7, 6 and 9, 6 and 11, 6 and 18, 6 and 36, 6 and 70, 6 and 76 6 and 86, 6 and 198. Home address is read after each Seek and examined for validity.

3. OPERATING PROCEDURES

The Disc Handler Routine DSKII is used as a standard interface between the program and MCR. All operating procedures described in the DSKII documentation hold equally well for this program. See PDD 3844459.

3.1 Initialization. See DSKII documentation. The program is called by typing in the name D4110.

3.2 Test Program Parameters. See DSKII documentation. The following parameter pertains to test 4 only:

V17/$n_1n_1n_2n_2n_3n_3n_4n_4$/mm

$n_1n_1n_2n_2n_3n_3n_4n_4$ = from 2 to 4 hexadecimal cylinder numbers. n_3 and n_4 must contain FF_{16} if no cylinder(s) is to be selected.

mm = 01 if test 4 is to loop continuously on the Seek command chain. Two spaces are entered to exit the test after 1 execution of the chain.

ΔΔΔΔΔΔ = 6 spaces must follow

3.3 Test Program Messages. The DSKII documentation describes all test entry and exit messages and a standard I-O error message. Data errors are detected by the program, and all data error messages are contained in the program. Register 9 is used to jump to the various error routines, so its contents are printed with most error messages.

3.3.1 Test 1 - A simple parameter setting is performed here, so no errors can occur.

3.3.2 All Tests

R9 XXXXXXXX
C & H XX XX READ INSTEAD OF C & H
XX XX - SEEK COMMAND NO. n
CHAIN STARTING ADDRESS XXXX

The Home Address on the track does not match the cylinder and head number of the Seek command.

NOTE: The cylinder and head numbers used in the Seek commands of the previous executed chain are stored in memory 64_{10} bytes after the chain starting address specified in the error message.

4. SUPPLEMENTARY DATA

4.1 Supplementary Software Information. Each test of the program is entered separately by DSKII and stands alone. It could be extracted from the rest of the program and either be eliminated or assembled by itself with DSKII.

4.2 Supplementary Hardware Information. See DSKII documentation.